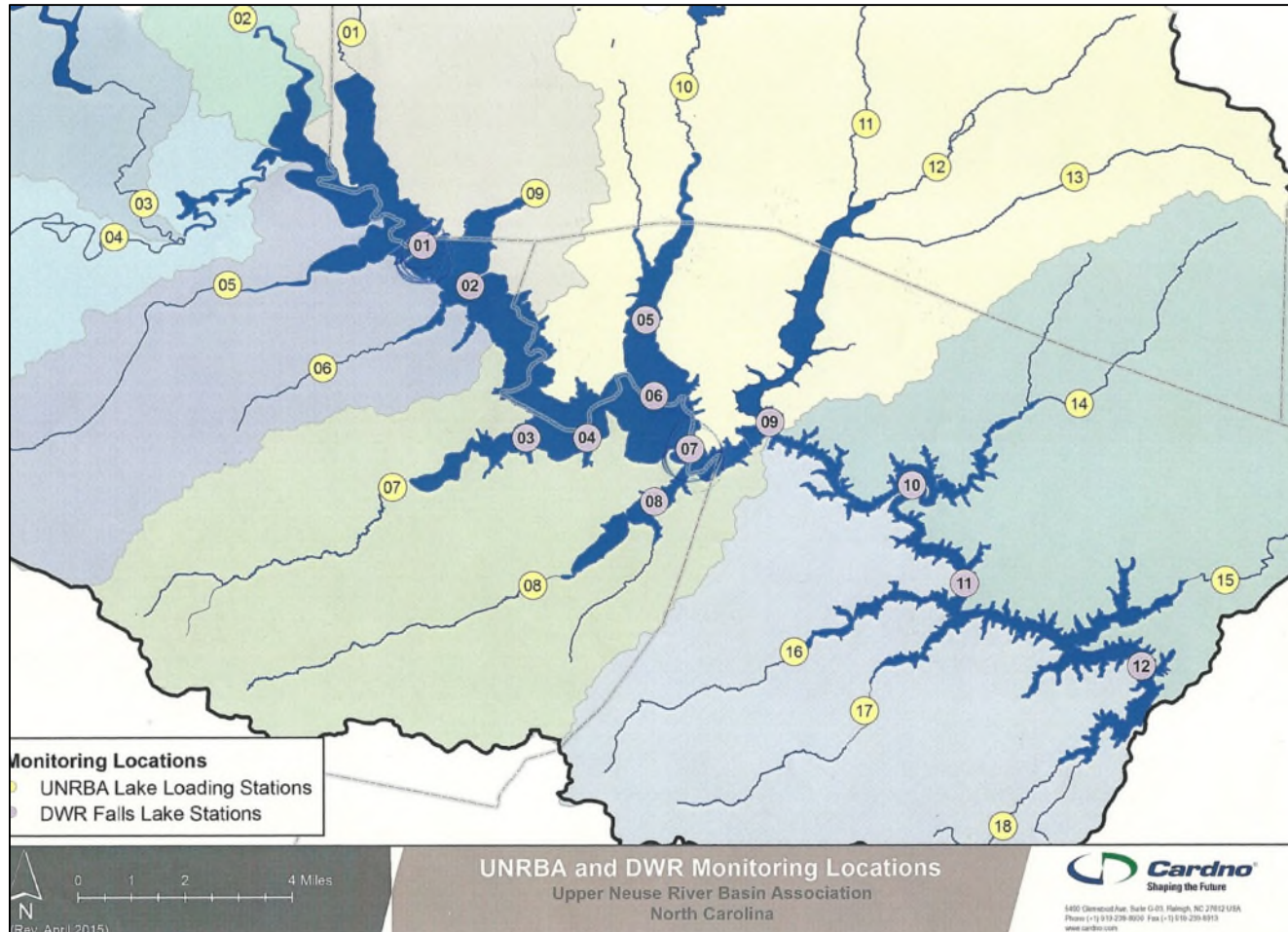
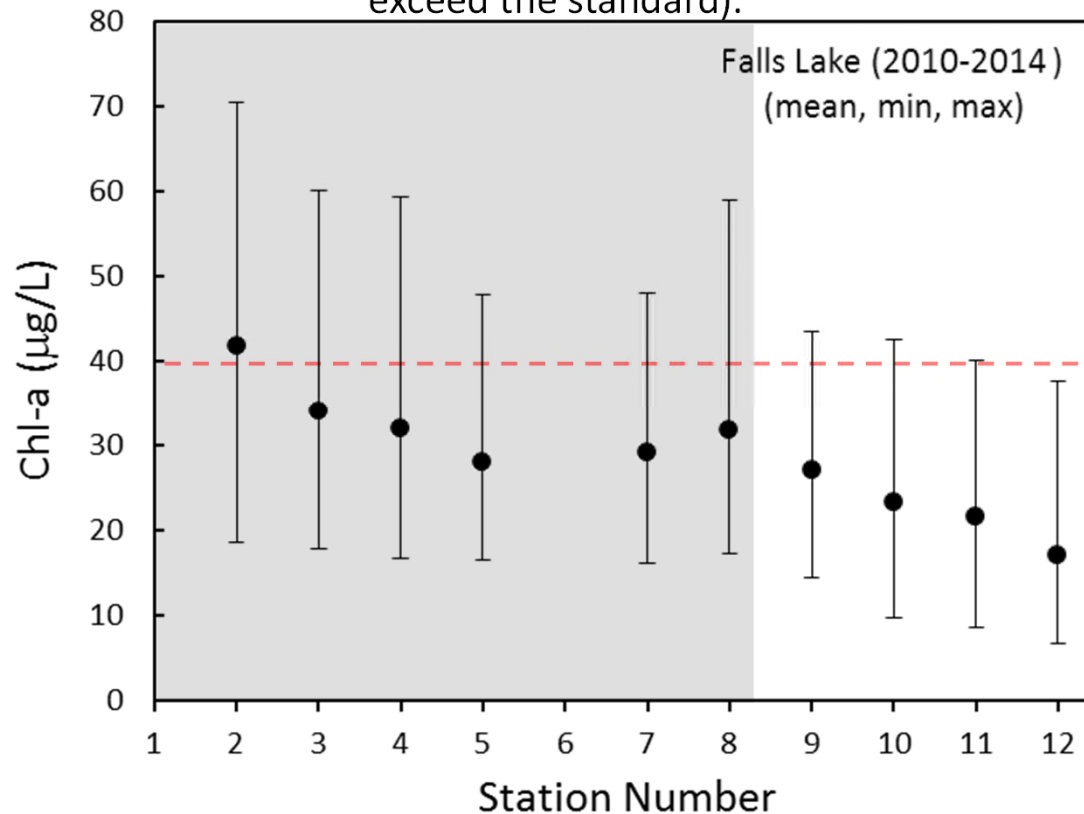


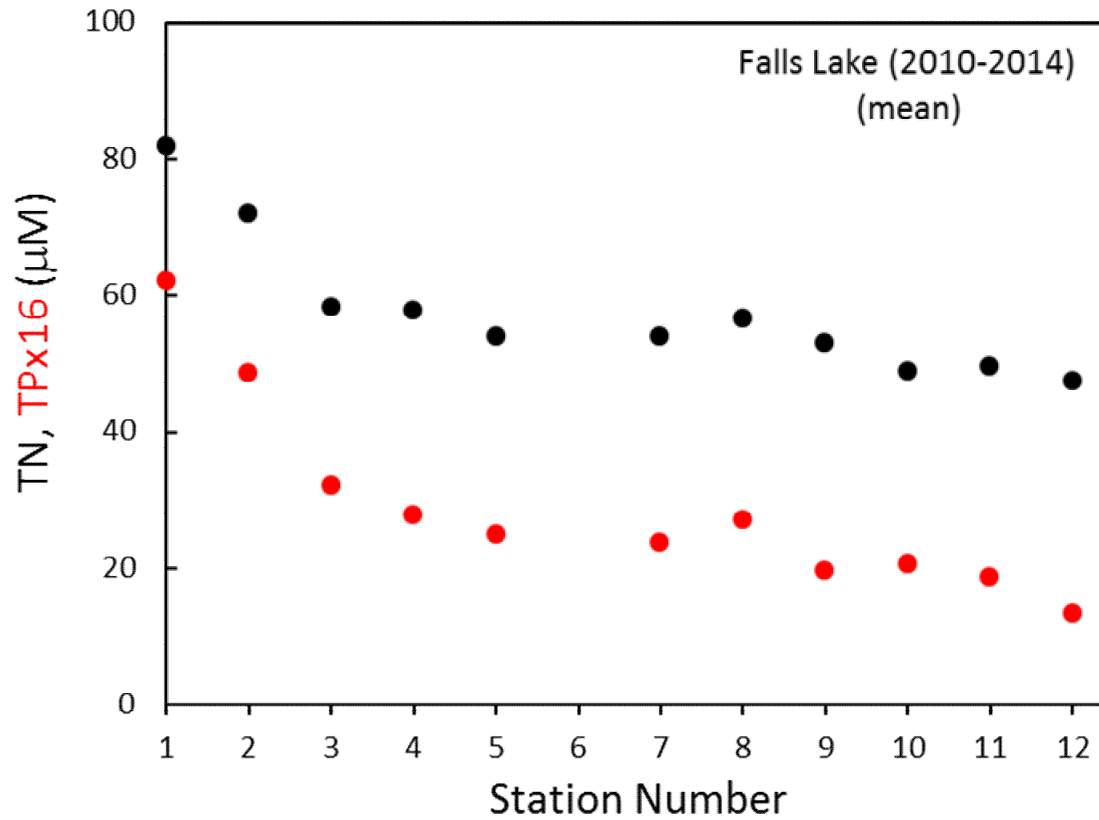
# Sediments as a Source of Nutrients (N & P) to Falls Lake Algal Production

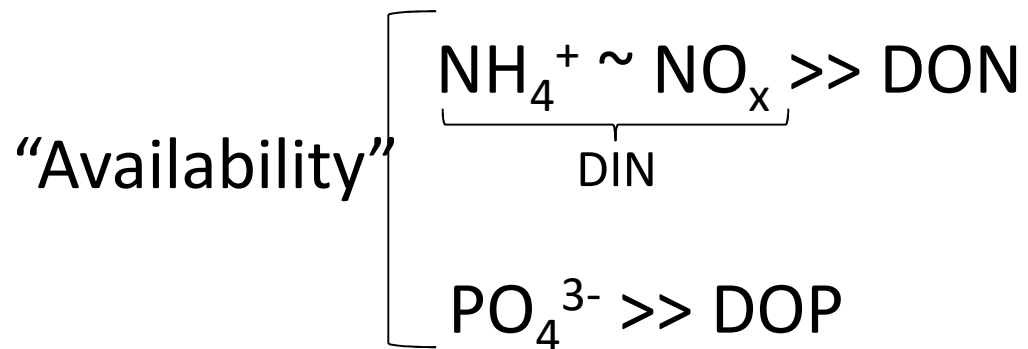
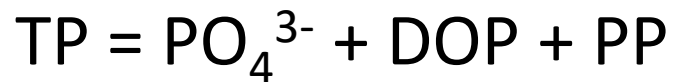
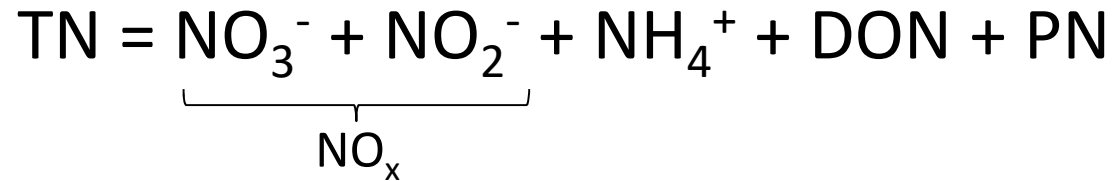


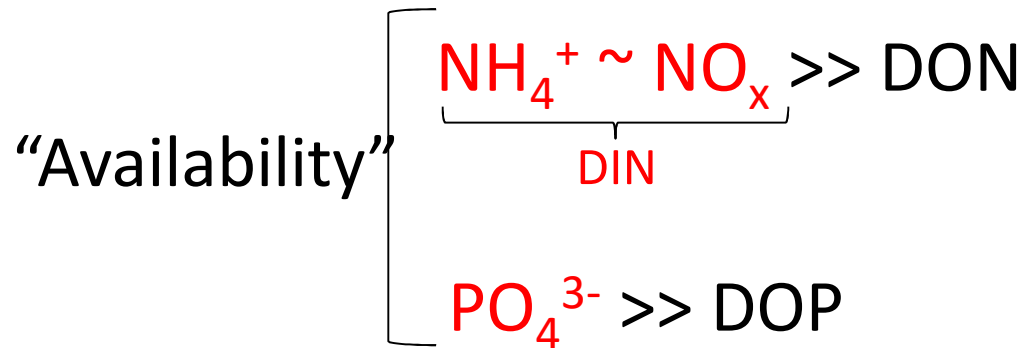
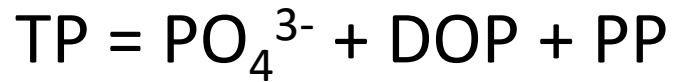
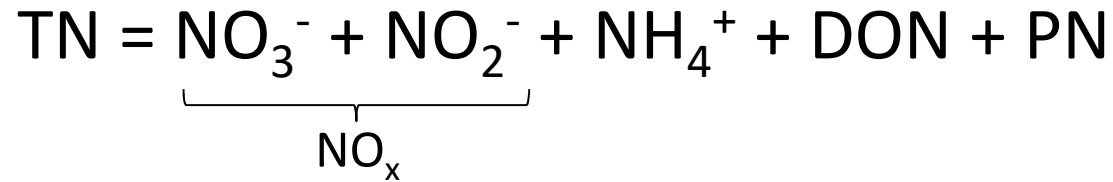
## NC Water Quality Standard (“10/40 criterion”)

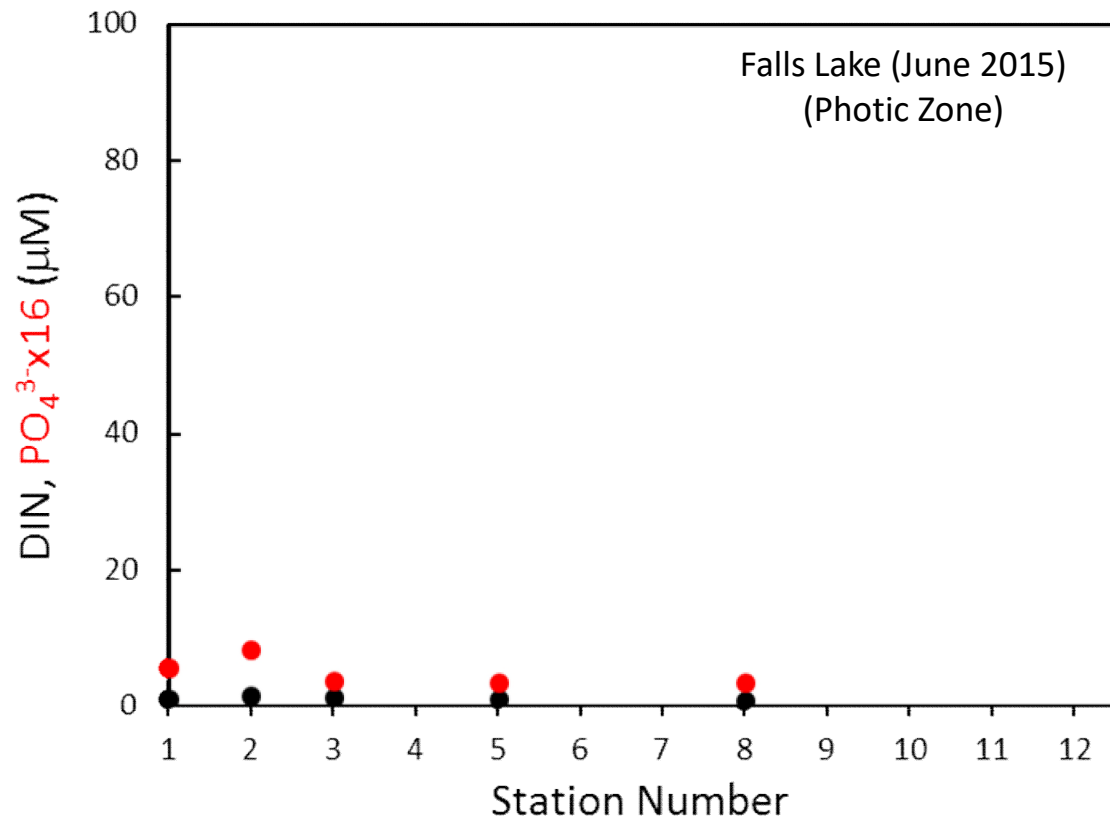
<40  $\mu\text{g chl-a/L}$  for lakes, sounds, estuaries, reservoirs, and other slow-moving waters not designated as trout waters (10% of measurements may exceed the standard).

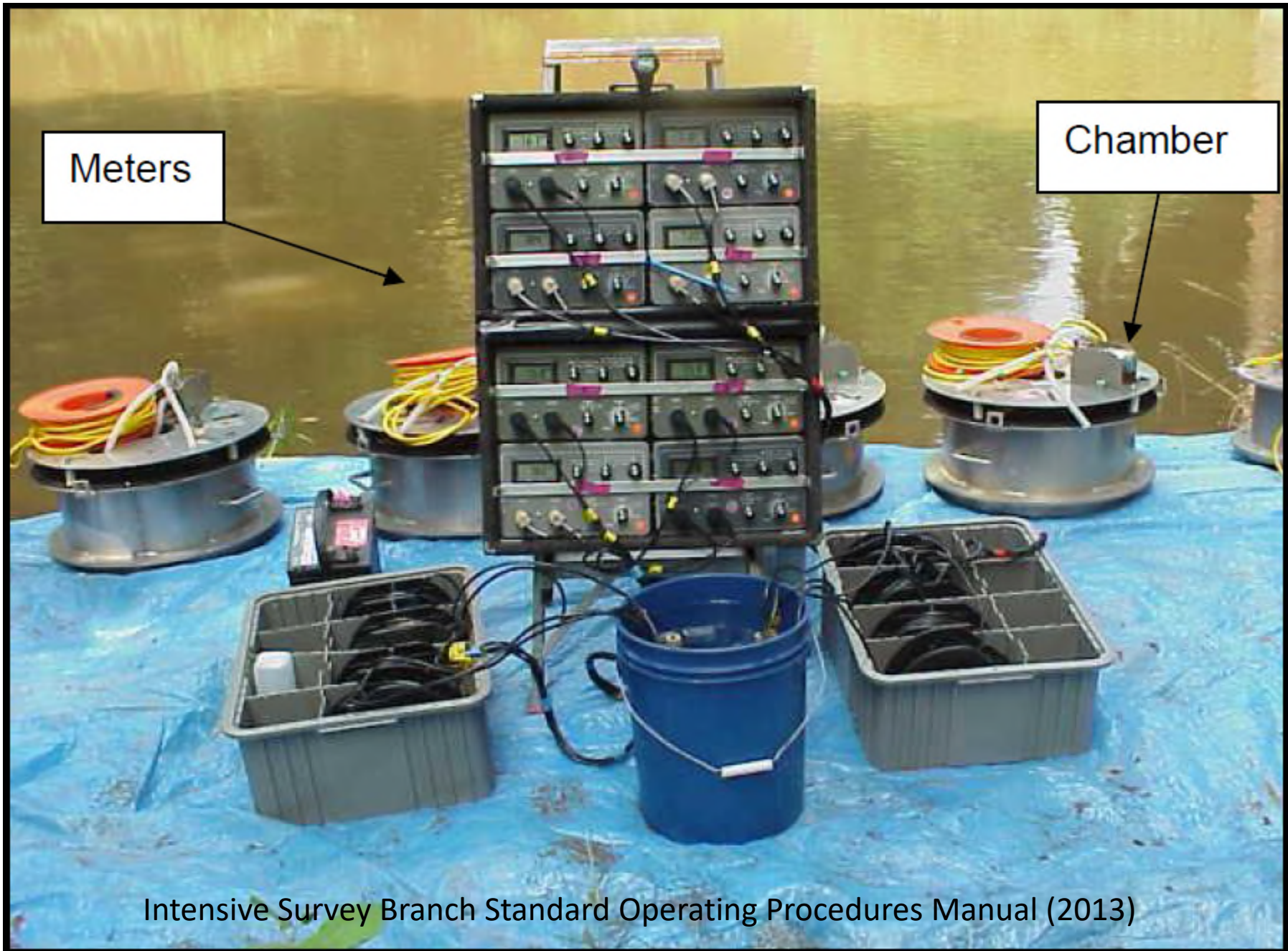










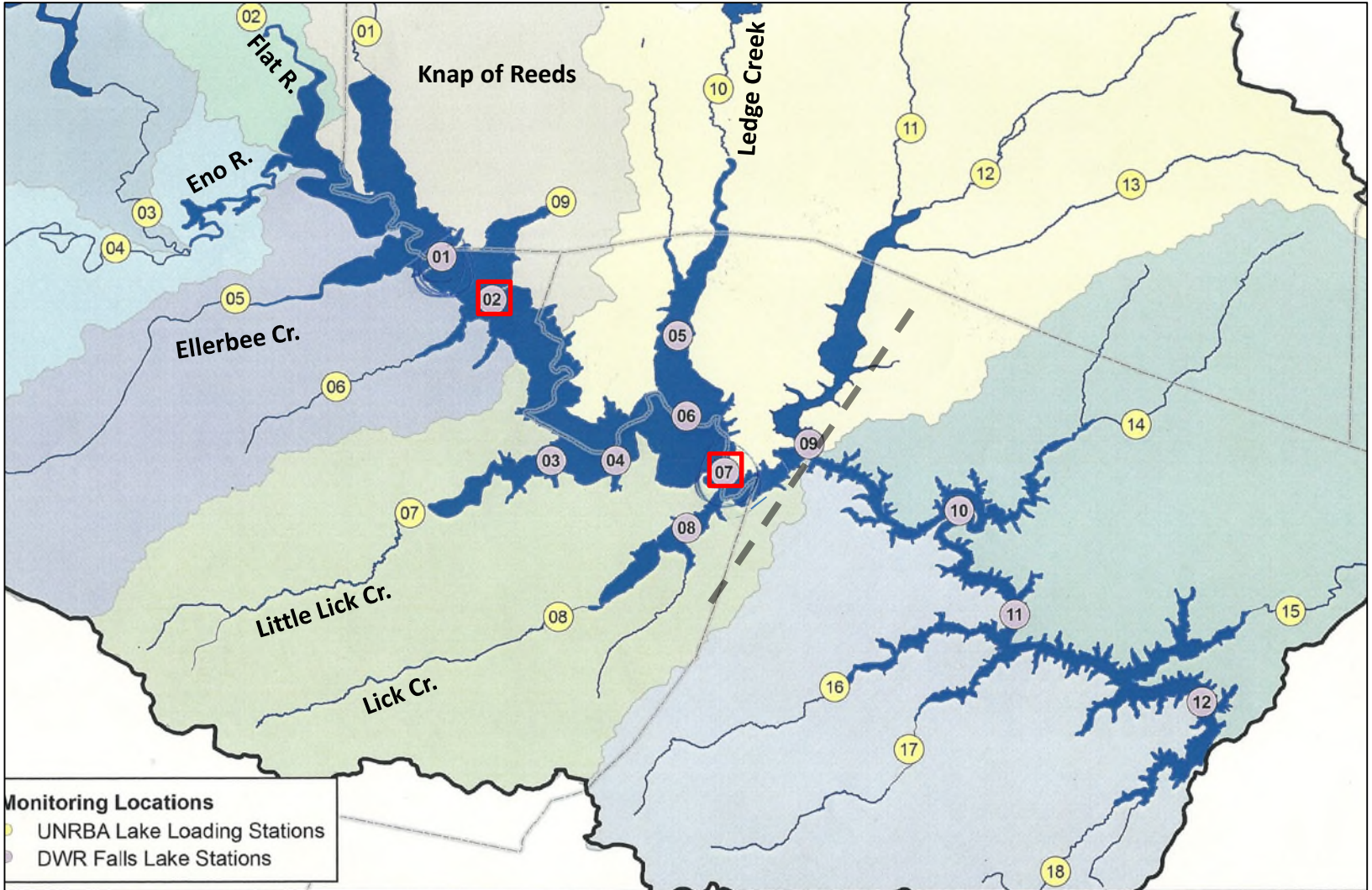


Meters

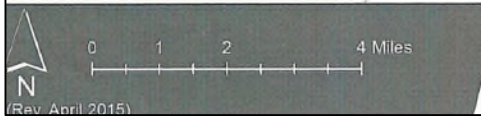
Chamber

Intensive Survey Branch Standard Operating Procedures Manual (2013)

April 2006



**Monitoring Locations**  
● UNRBA Lake Loading Stations  
● DWR Falls Lake Stations

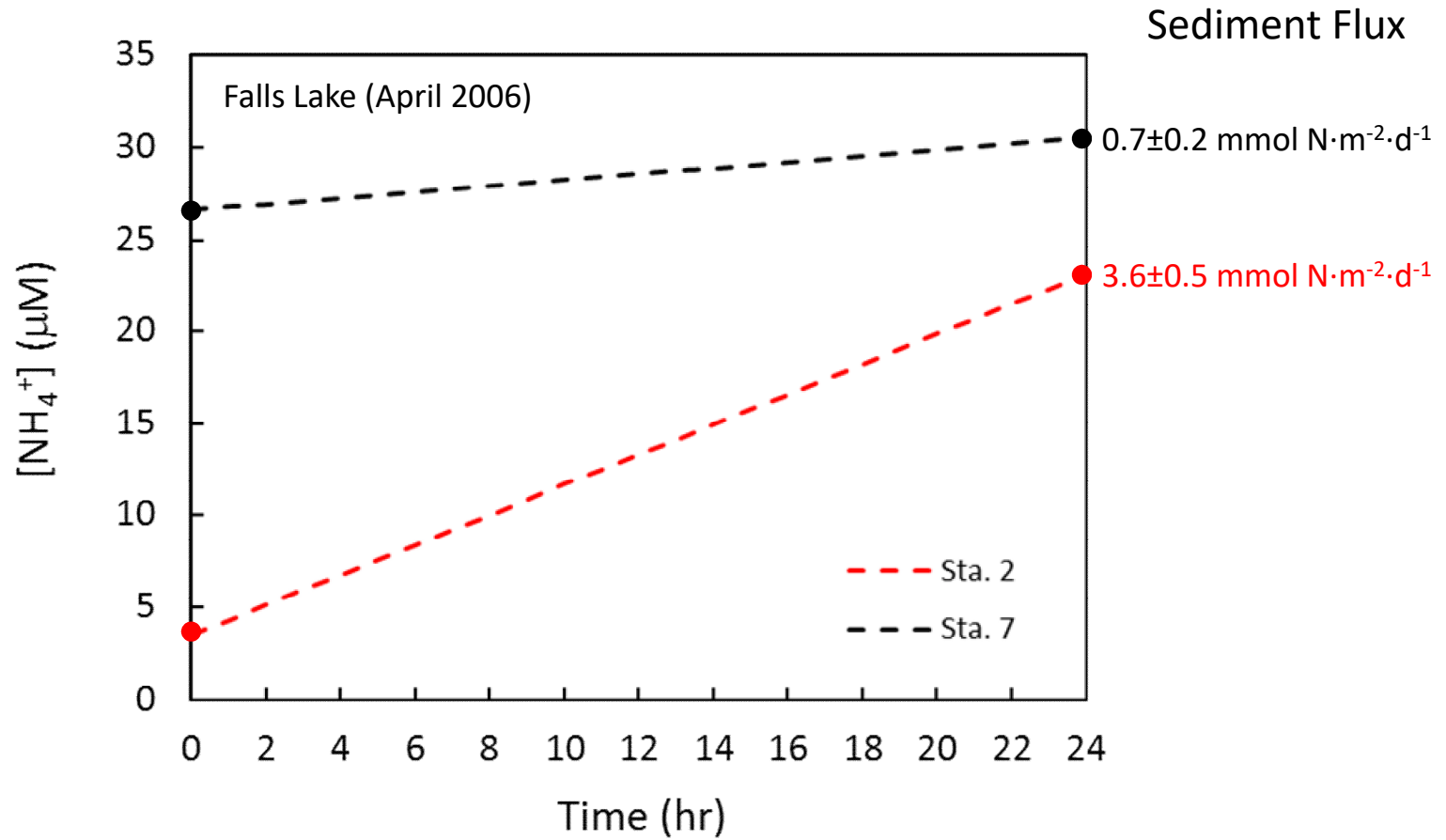


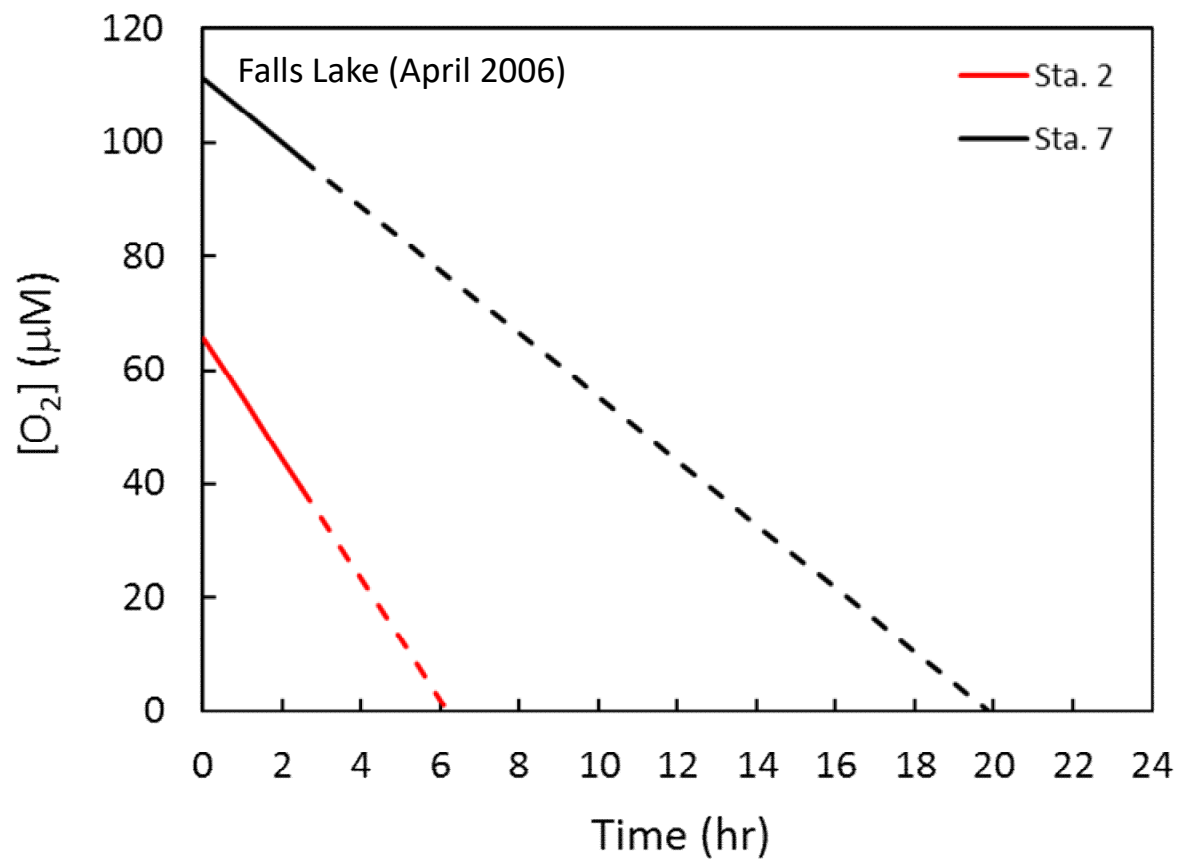
**UNRBA and DWR Monitoring Locations**  
Upper Neuse River Basin Association  
North Carolina

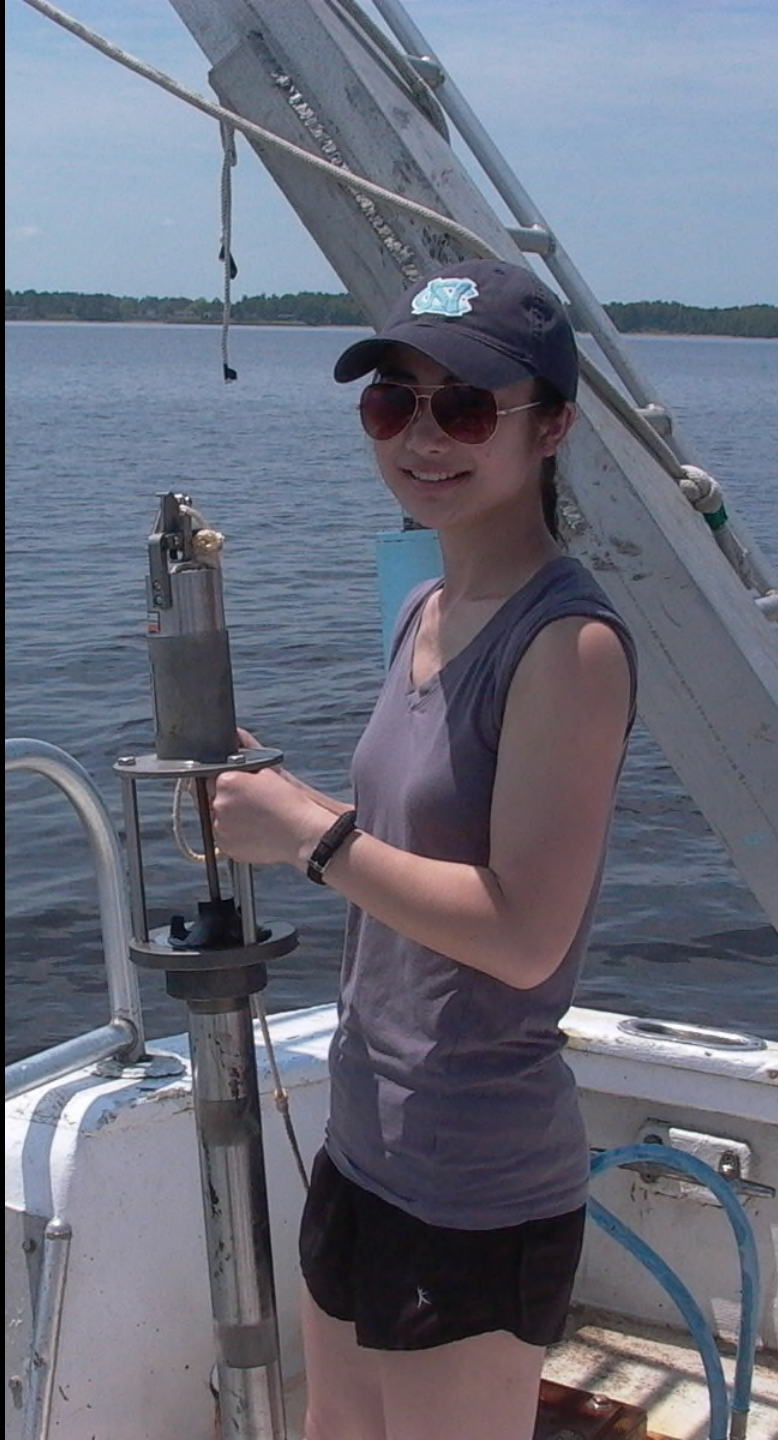


5400 Glenwood Ave., Suite G-03, Raleigh, NC 27612 USA  
Phone (+1) 919-239-8609 Fax (+1) 919-239-8913  
www.cardno.com

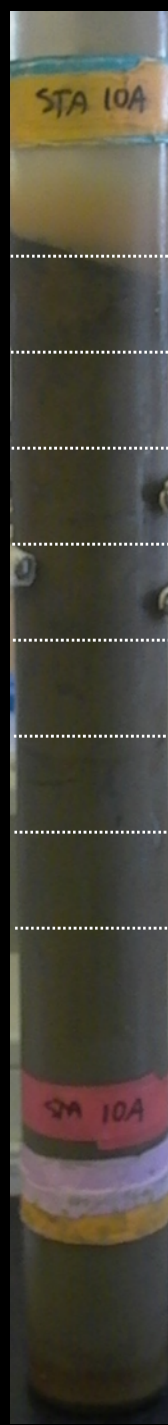




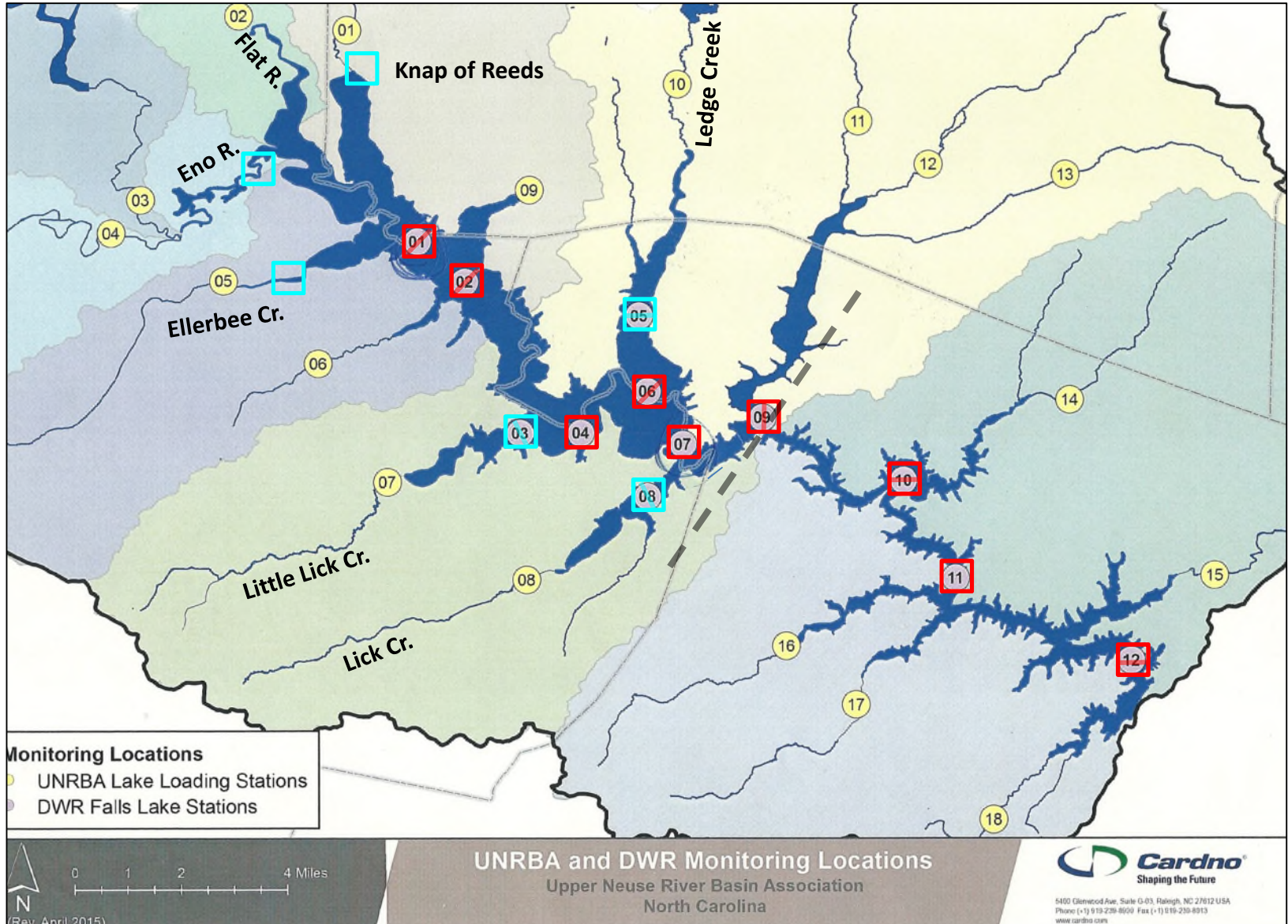




36.5 cm

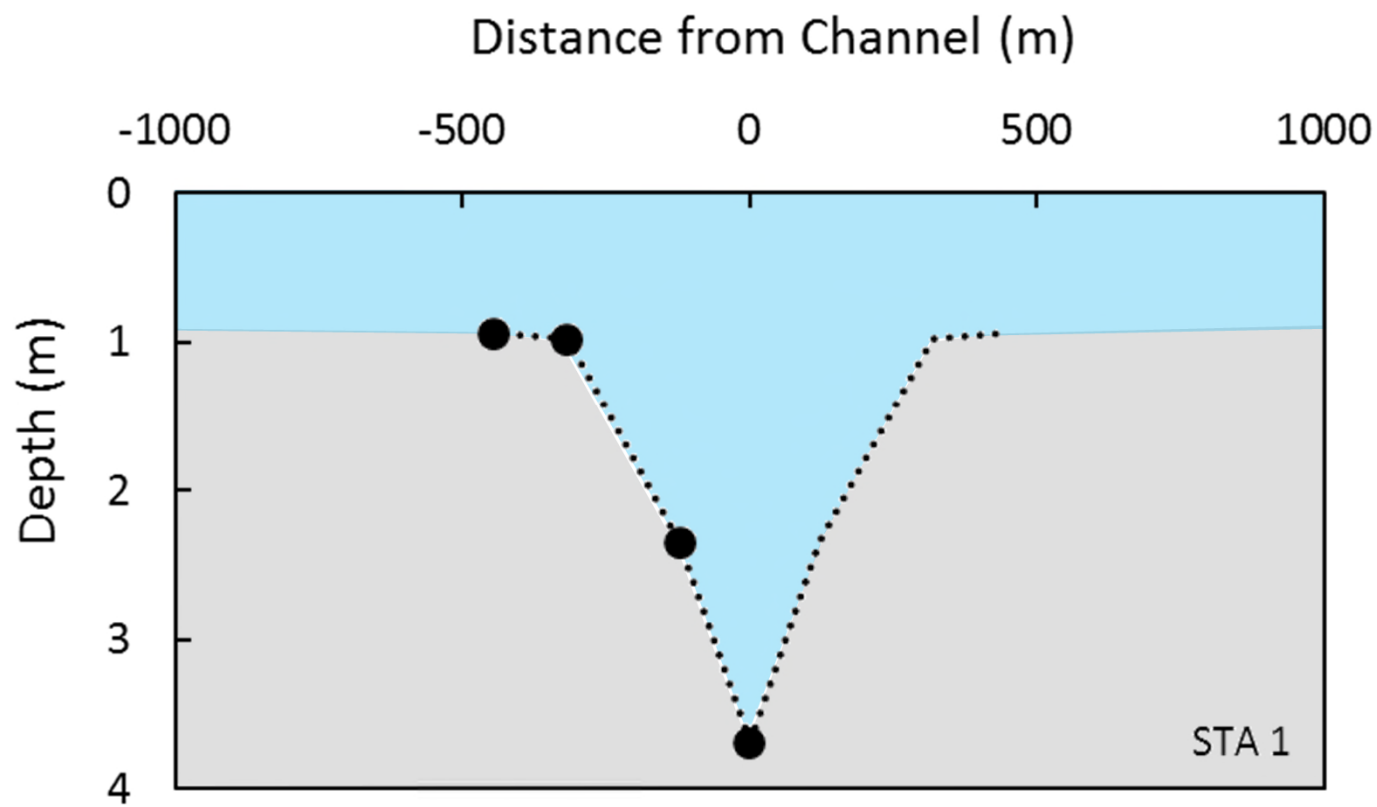


27 Stations; 29 Cores; 9 "Transects"  



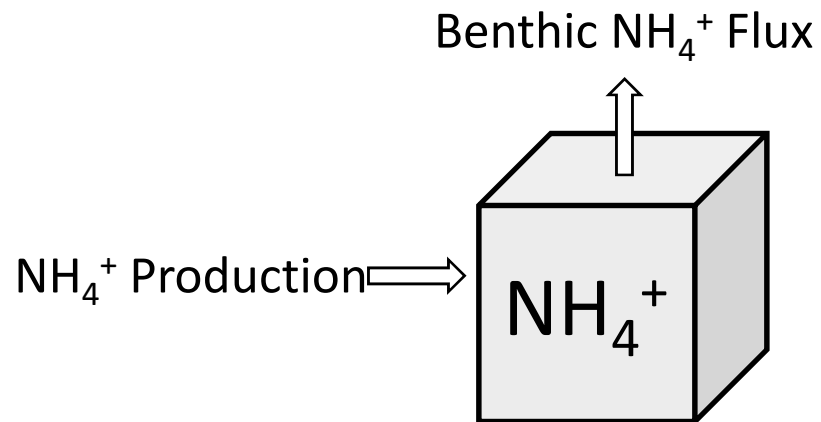
 Neuse River Main Stem Stations

 Tributary (flooded) Stations

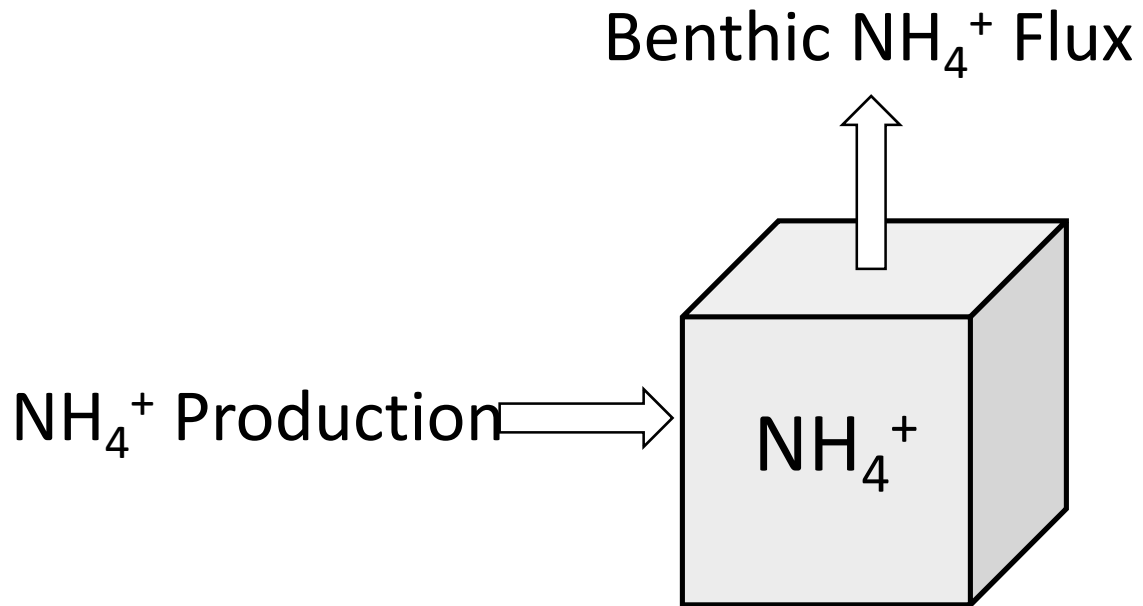




# Sediment Flux Model

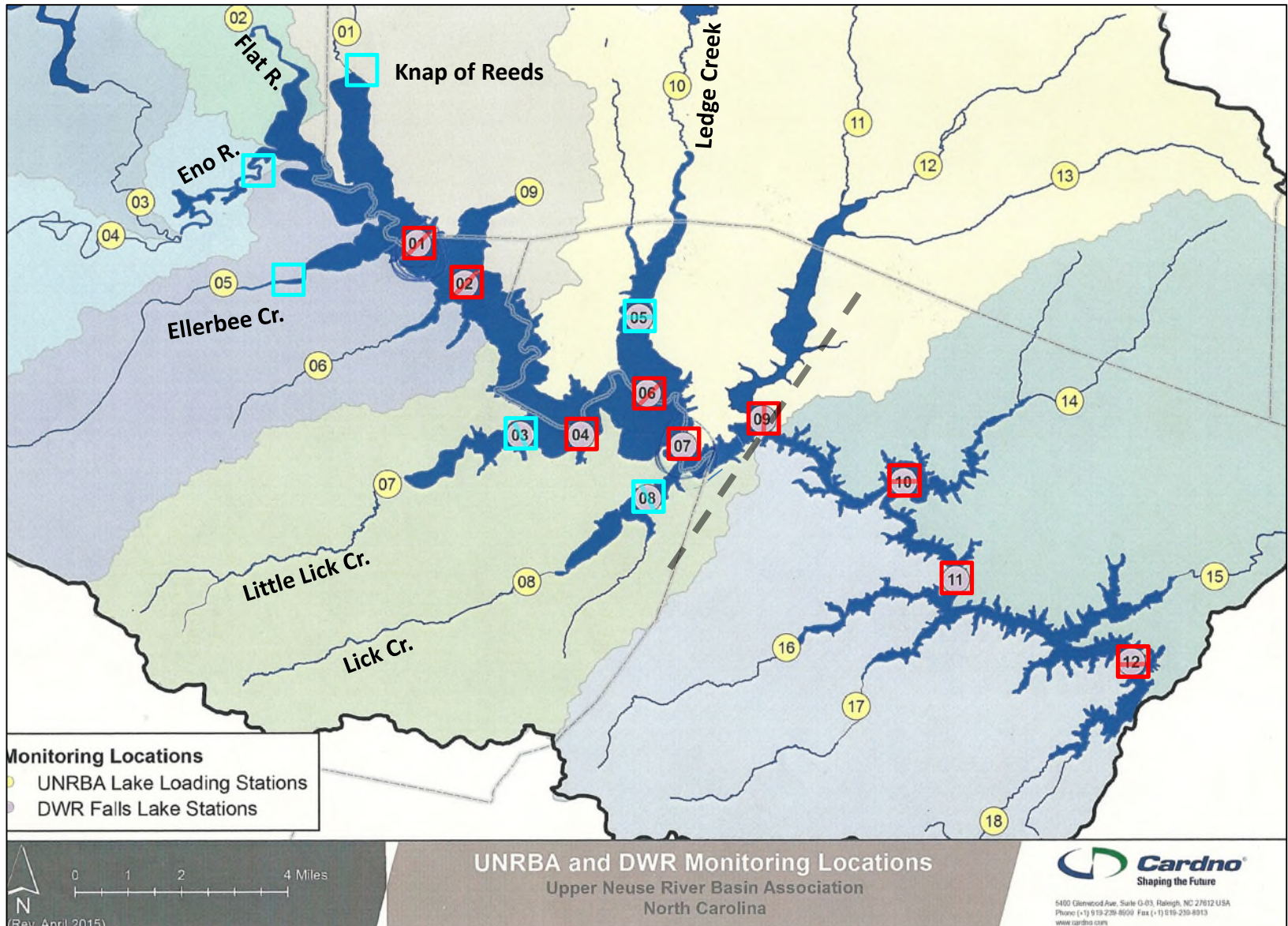


# Sediment Flux Model



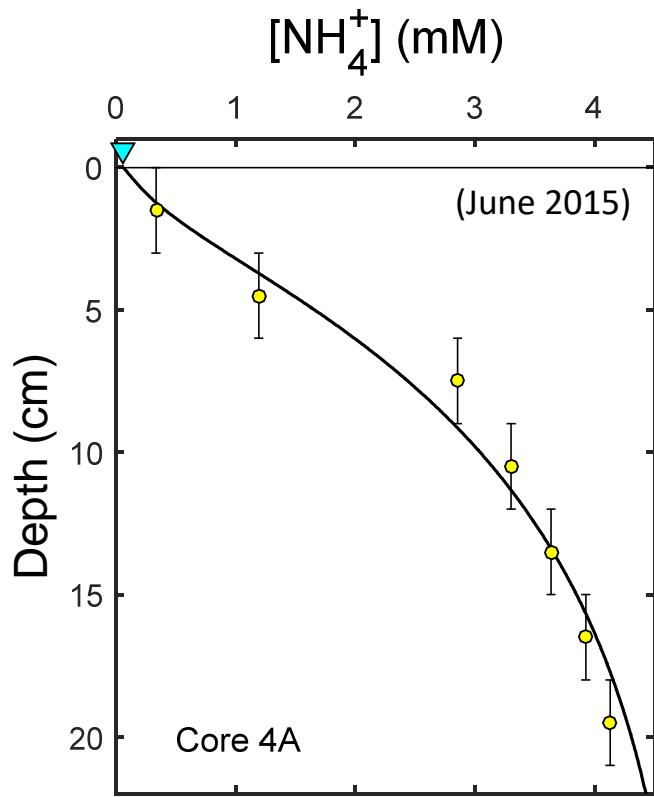


27 Stations; 29 Cores; 9 "Transects"  



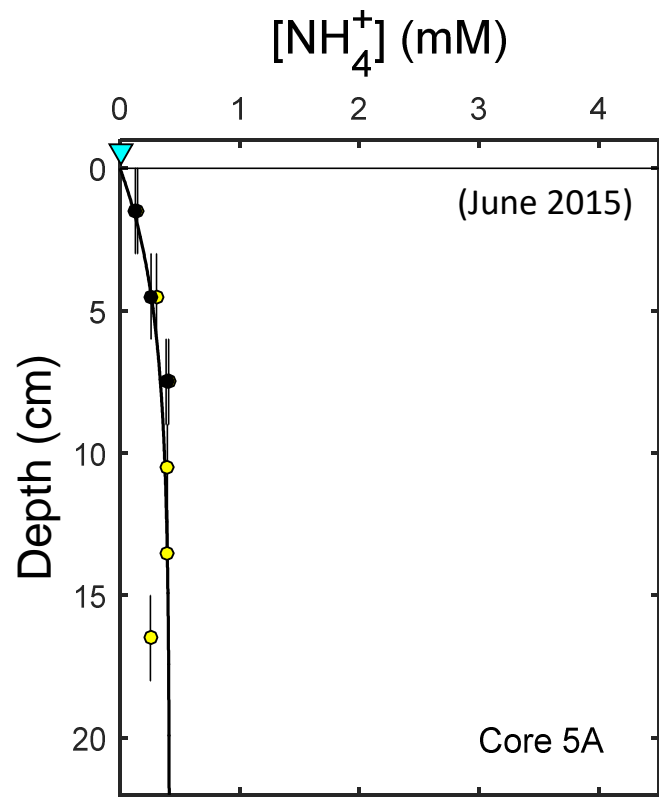
 Neuse River Main Stem Stations

 Tributary (flooded) Stations



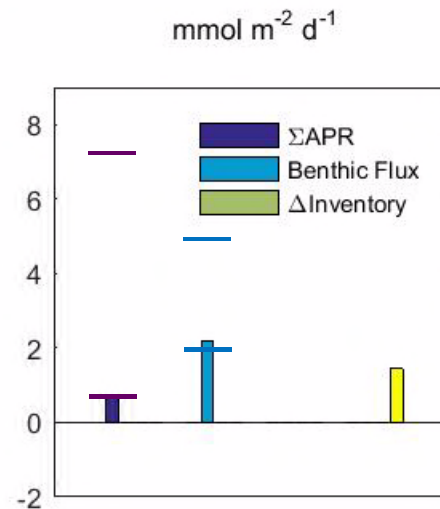
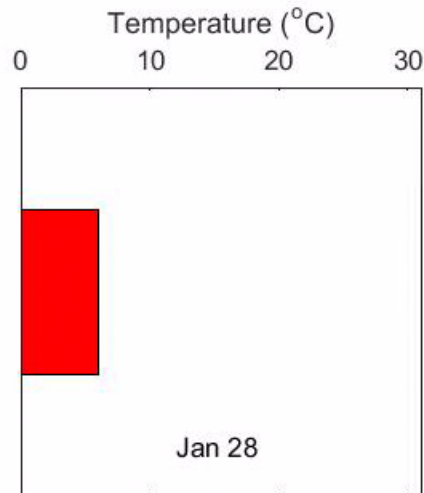
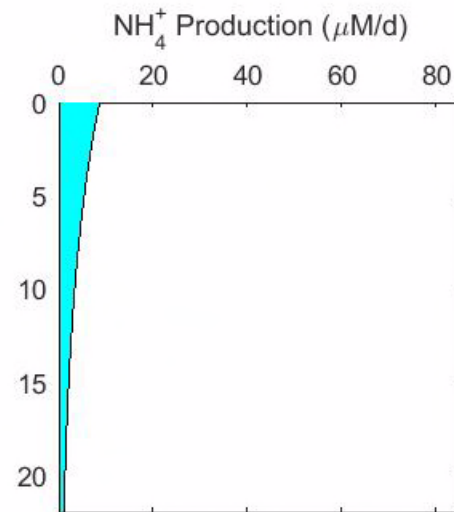
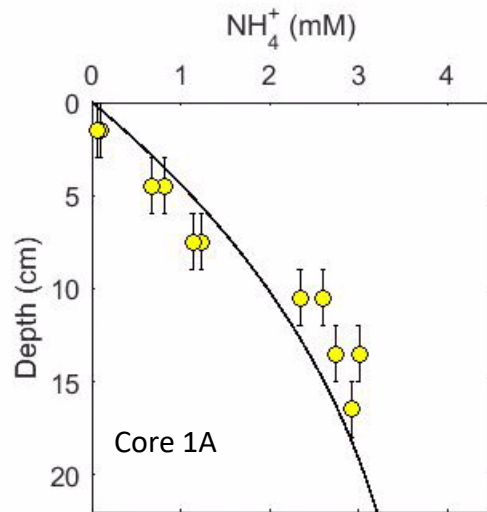
Sediment Flux

$5.7 \text{ mmol N}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$



$1.1 \text{ mmol N}\cdot\text{m}^{-2}\cdot\text{d}^{-1}$

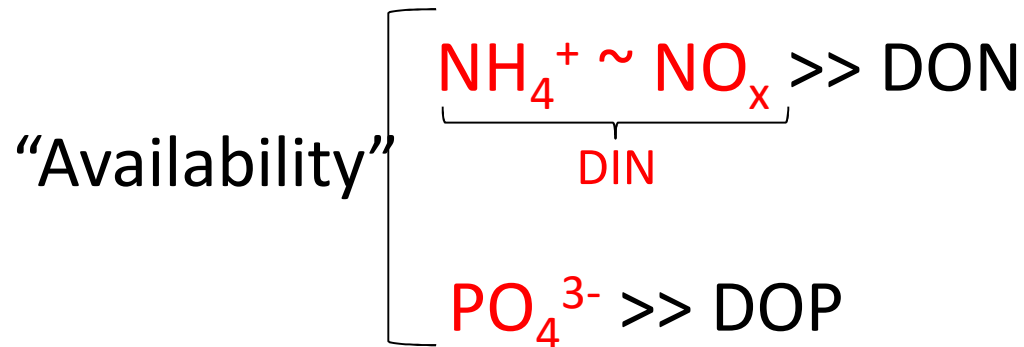
# How Does the Sediment $\text{NH}_4^+$ Flux Vary with Season?



# Sediments as a Source of Nutrients (N) to Falls Lake Algal Production

$$\text{Total Benthic NH}_4^+ \text{ Flux: } \underbrace{\left( \frac{> 2 \text{ mmol N}}{\text{m}^2 \cdot \text{d}} \right)}_{\text{average flux}} \underbrace{\left( 5 \times 10^7 \text{ m}^2 \right)}_{\text{surface area}} \left( \frac{14 \text{ mg N}}{\text{mmol N}} \right) \left( \frac{1 \text{ kg}}{10^6 \text{ mg}} \right) \left( \frac{365 \text{ d}}{\text{y}} \right) \left( \frac{\text{ton}}{10^3 \text{ kg}} \right) > 500 \text{ ton N/y}$$

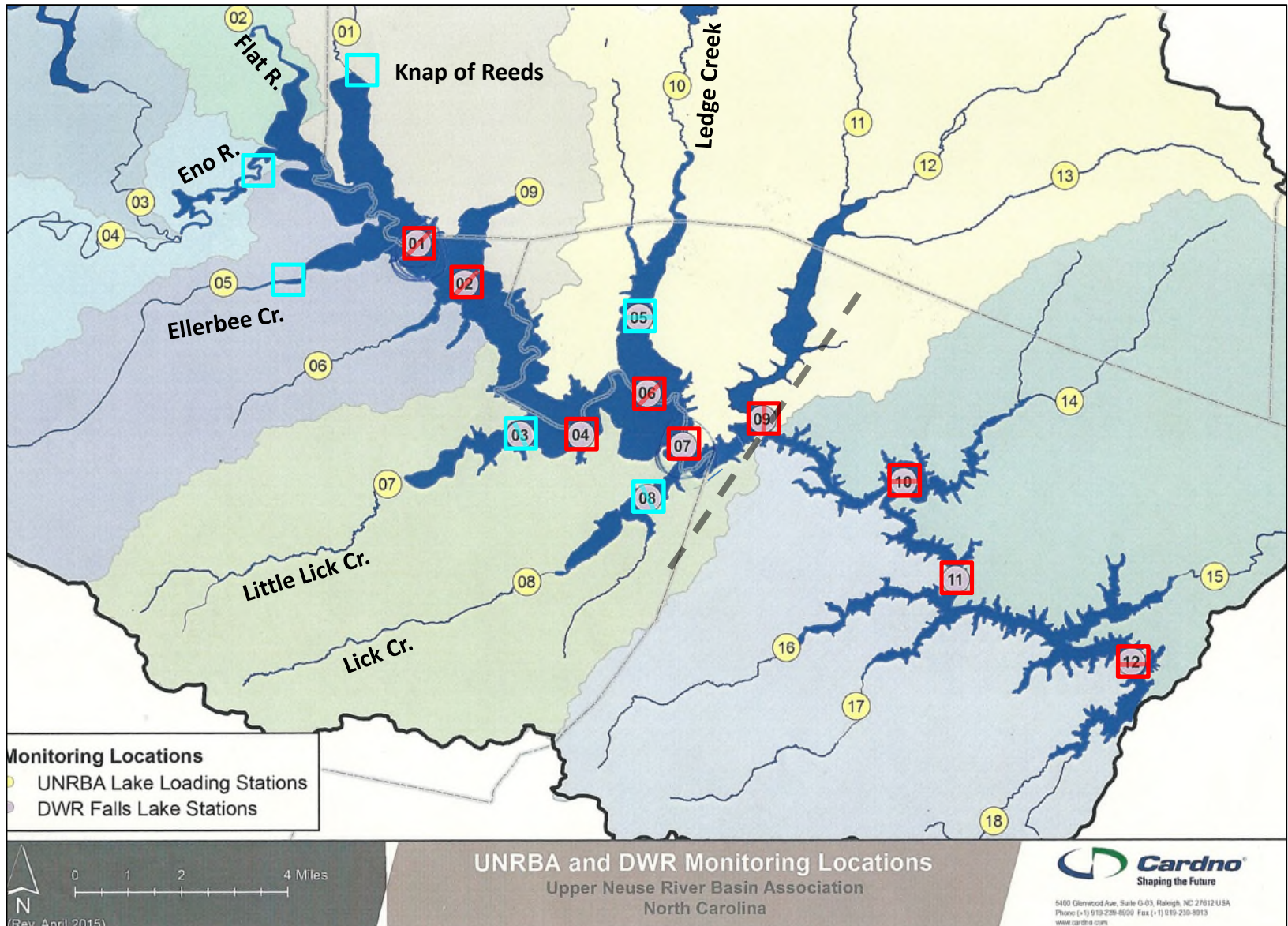
TN Loading (2005-2007): 240 – 550 ton N/y (Lin & Li, 2011)



## Conclusion:

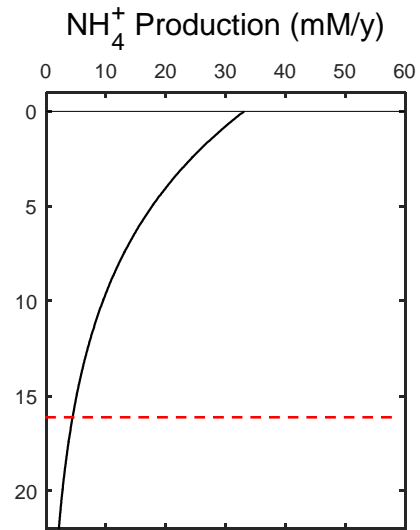
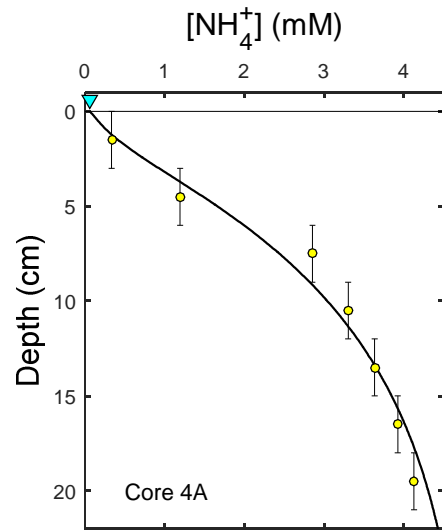
Sediments are a Major Source of Nutrients (N)  
to Falls Lake Algal Production

27 Stations; 29 Cores; 9 "Transects"  

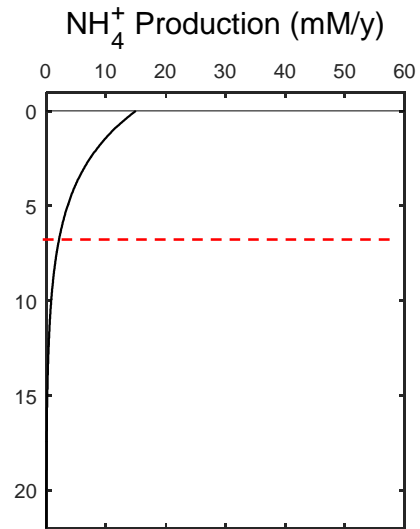
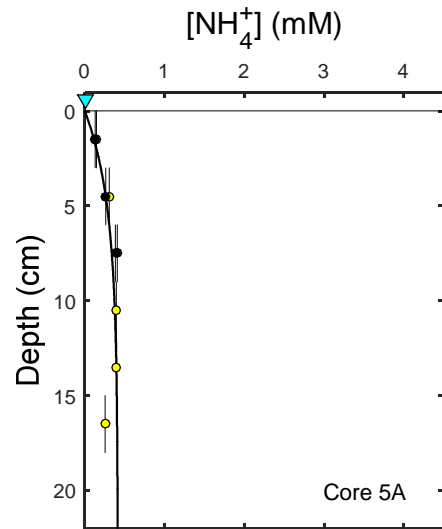


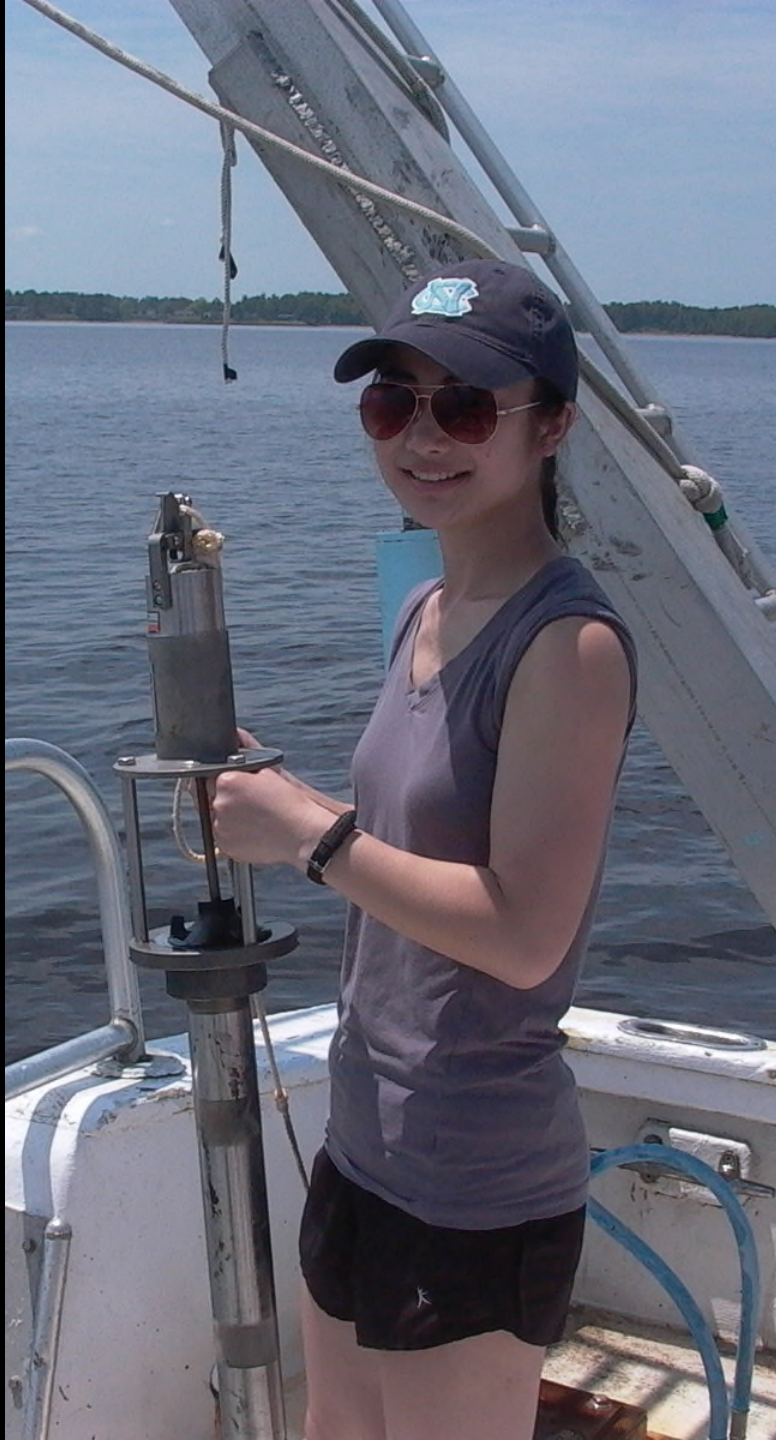
 Neuse River Main Stem Stations

 Tributary (flooded) Stations

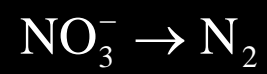
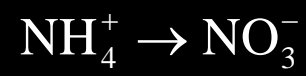
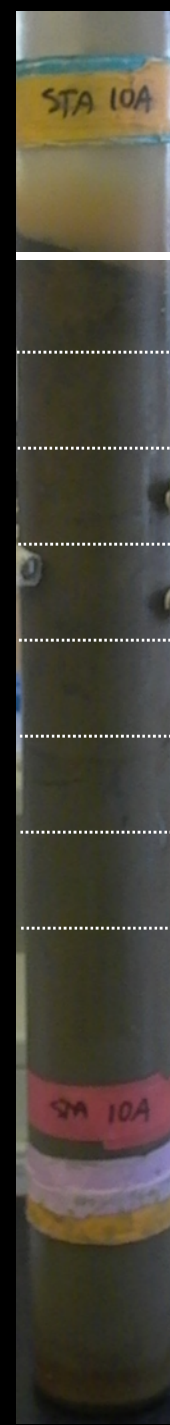


$$\frac{13 \text{ cm}}{0.5 \text{ cm/y}} = 26 \text{ y}$$

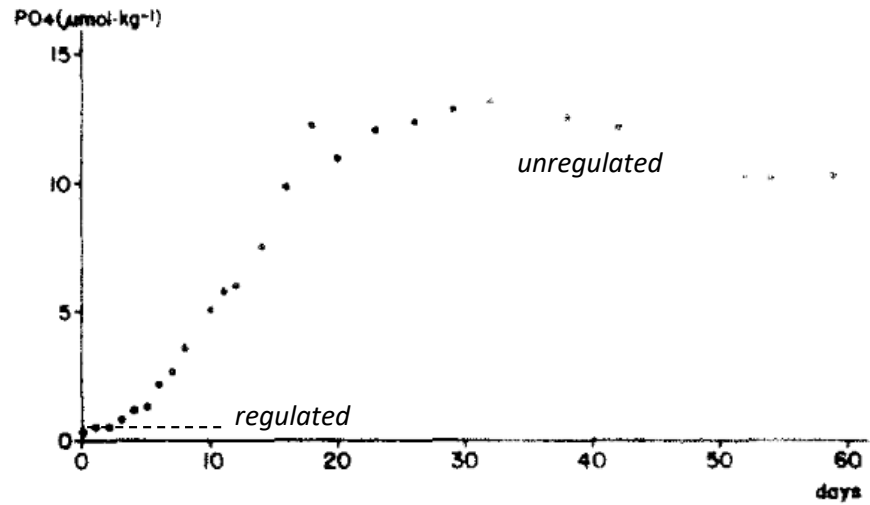
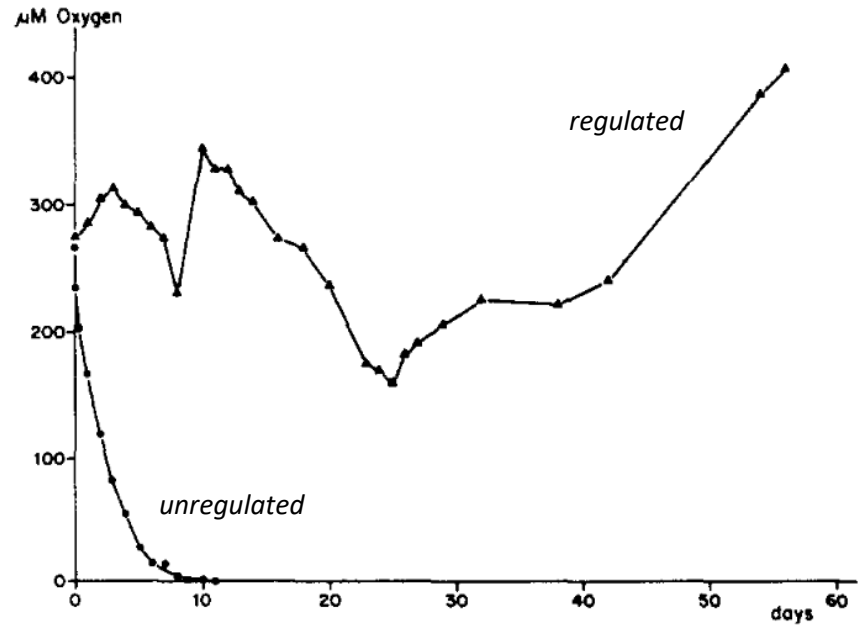
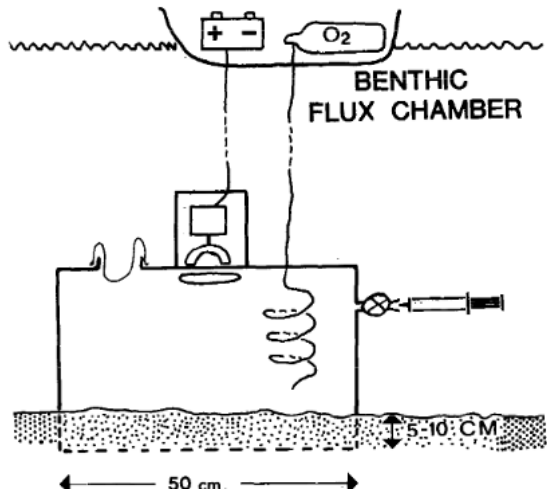




36.5 cm







Sundby et al. (1986)

# Neuse River Estuary N Budget

